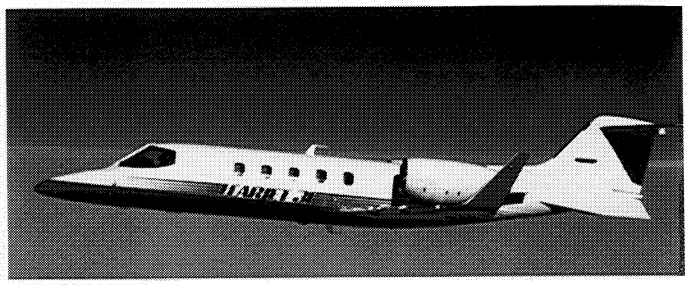
Business Jets



Shown at top is the new Learjet 31 business jet and below it its larger and heavier companion, the Learjet 55C. Both are built by Learjet Corporation, Tucson, Arizona and both feature NASA-developed "winglets," nearly vertical extensions of the wing (closeup at lower right) designed to reduce fuel consumption and generally improve airplane performance.

Powered by twin turbofans, the aircraft carry up to 10 passengers. The Model 55C, which takes off at 21,000 pounds, is the largest of the Learjet family. The Model 31 (15,500 pounds) is the lowest priced Learjet, an "entry level" airplane intended for the business aircraft operator who wants to move up from propeller-driven aircraft to jet performance. Both feature Delta Fins, innovative company-designed tail surfaces that provide high directional stability at all speeds and improved handling in the traffic pattern and at lower takeoff, approach and landing speeds. Both airplanes are expected to receive Federal Aviation Administration certification in mid-1988.

Winglets are lifting surfaces designed to operate in the "vortex," or air whirlpool, that occurs at an airplane's wingtip. This complex flow of air creates air drag; the winglet's job is to reduce the strength of the vortex and thereby substantially reduce drag. Additionally, the winglet generates its own lift, producing forward thrust in the manner of a boat's sail. The combination of reduced drag and additional thrust adds up to significant improvement in fuel efficiency.

Winglets are particularly effective on the two new Learjets, which can routinely operate above 45,000 feet and are capable of flying at altitudes up to 51,000 feet. At such altitudes, where the air is thinner, the drag reduction afforded by the winglets is more pronounced.

Learjet was the first manufacturer to use the winglet design in production aircraft, initially on the Models 28/29 introduced to service in 1979. Several other plane builders are taking advantage of the NASA technology, notably McDonnell Douglas in its new MD-11 jetliner. ▲